

**[0017]** In a further aspect, the microsphere further comprises, or alternatively consists essentially of, or yet further consists of an agent that is selective against a pathogen.

**[0018]** In a yet further aspect, a complimentary agent is coated on the surface of the microsphere and/or encapsulated within a hollow core of the microsphere.

**[0019]** In another aspect, the microsphere comprises, or alternatively consists essentially of, or yet further consists of a metal selected from one or more of cobalt, chromium, gold, nickel, platinum, stainless steel, titanium, tantalum, nickel-titanium, an alloy, and combinations thereof.

**[0020]** In a further aspect, the microsphere comprises, or alternatively consists essentially of, or yet further consists of a biodegradable polymer selected from one or more of: dextran; dextranomer; poly(lactic-co-glycolic acid) or PLGA; polycaprolactone or PLC; Chitosan; Gelatin; DNA hydrogen; acetalated dextran; poly(lactide); poly(glycolide); poly(lactide-co-glycolide); poly(lactic acid); poly(glycolic acid); poly(lactic acid-co-glycolic acid); poly(lactide)/poly(ethylene glycol) copolymers; poly(glycolide)/poly(ethylene glycol) copolymer; poly(lactide-co-glycolide)/poly(ethylene glycol) copolymers; poly(lactic acid)/poly(ethylene glycol) copolymer; poly(glycolic acid)/poly(ethylene glycol) copolymer; poly(lactic acid-co-glycolic acid)/poly(ethylene glycol) copolymer; poly(caprolactone); poly(caprolactone)/poly(ethylene glycol) copolymer; poly(orthoester); poly(phosphazene); poly(hydroxybutyrate); poly(hydroxybutyrate); poly(lactide-co-caprolactone); polycarbonate; polyesteramide; polyanhydride; poly(dioxanone); poly(alkylene alkylate); poly(ethylene glycol)/poly(orthoester) copolymer; polyurethane; poly(amino acid); polyetherester; polyacetal; polycyanoacrylate; poly(oxyethylene)/poly(oxypropylene) copolymer; Sephadex® copolymers and/or a combination thereof. In a yet further aspect, the microsphere comprises, or alternatively consists essentially of, or yet further consists of a non-biodegradable polymer selected from one or more of poly(ethylene vinyl acetate), poly(vinyl acetate), silicone polymers, polyurethanes, polysaccharides such as a cellulosic polymers and cellulose derivatives, acyl substituted cellulose acetates and derivatives thereof, copolymers of poly(ethylene glycol) and poly(butylene terephthalate), polystyrenes, polyvinyl chloride, polyvinyl fluoride, poly(vinyl imidazole), chorosulphonated polyolefins, polyethylene oxide, and copolymers and blends thereof.

**[0021]** In another aspect, the microsphere comprises, or alternatively consists essentially of, or yet further consists of a polymer selected from one or more of: epichlorohydrin cross-linked dextran (Sephadex), G-25 epichlorohydrin cross-linked dextran, poly(lactic-co-glycolic acid) ("PLGA"); polycaprolactone ("PLC"); chitosan; gelatin; DNA hydrogen; acetalated dextran; poly(lactide); poly(glycolide); poly(lactide-co-glycolide); poly(lactic acid); poly(glycolic acid); poly(lactic acid-co-glycolic acid); poly(lactide)/poly(ethylene glycol) copolymers; poly(glycolide)/poly(ethylene glycol) copolymer; poly(lactide-co-glycolide)/poly(ethylene glycol) copolymers; poly(lactic acid)/poly(ethylene glycol) copolymer; poly(glycolic acid)/poly(ethylene glycol) copolymer; poly(lactic acid-co-glycolic acid)/poly(ethylene glycol) copolymer; poly(caprolactone); poly(caprolactone)/poly(ethylene glycol) copolymer; poly(orthoester); poly(phosphazene); poly(hydroxybutyrate); poly(hydroxybutyrate); poly(lactide-co-caprolactone); polycarbonate; polyesteramide; polyanhydride; poly(dioxanone); poly(alkylene alkylate); poly(ethylene glycol)/

poly(orthoester) copolymer; polyurethane; poly(amino acid); polyetherester; polyacetal; polycyanoacrylate; poly(oxyethylene)/poly(oxypropylene) copolymer; and a combination thereof.

**[0022]** In a further aspect, the microsphere comprises, or alternatively consists essentially of, or yet further consists of a non-biodegradable polymer selected from one or more of: poly(ethylene vinyl acetate), poly(vinyl acetate), silicone polymers, polyurethanes, polysaccharides such as a cellulosic polymers and cellulose derivatives, acyl substituted cellulose acetates and derivatives thereof, copolymers of poly(ethylene glycol), poly(butylene terephthalate), polystyrenes, polyvinyl chloride, polyvinyl fluoride, poly(vinyl imidazole), chorosulphonated polyolefins, polyethylene oxide, and copolymers and blends thereof.

**[0023]** In one embodiment, the probiotic bacteria comprises, or alternatively consists essentially of, or yet further consists of *L. reuteri* and the prebiotic comprises glycerol or histidine. In a further aspect, the *L. reuteri* produces glucosyltransferase (GFT). In another aspect, the microsphere comprises, or alternatively consists essentially of, or yet further consists of dextran or dextranomer.

**[0024]** In a further aspect, the biofilm-generating probiotic bacterium expresses a DNABIII protein, and the microsphere comprises, or alternatively consists essentially of, or yet further consists of an effective amount of nutritional supplementation for the probiotic bacterium to support the formation of a biofilm on or within the microsphere, and wherein the prebiotic diffuses from within the microsphere.

**[0025]** In another aspect, the disease comprises one or more of inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), dysbiosis, colitis, enteric infectious disease, diarrheal illness, vaginosis, necrotizing enterocolitis (NEC), wound, burns, psoriasis, dermatitis, tooth decay, periodontitis, sinusitis, infection-induced colitis, traveler's diarrhea, psychological stress, psychological disorders, or any of chronic or recurrent disease that is caused by pathogenic bacteria displacing healthy bacteria.

**[0026]** In a yet further aspect, the disease is selected from the group of: psychological disorders, such as depression or anxiety, enteric infectious disease, infection-induced colitis, traveler's diarrhea, inflammatory bowel disease (IBD), colitis, diarrheal illness, vaginosis, wound, burns, psoriasis, dermatitis, tooth decay, periodontitis, sinusitis, or any of chronic and/or recurrent disease that is caused by pathogenic bacteria displacing healthy bacteria or necrotizing enterocolitis (NEC), and to support anti-bacterial immunity, enhancing or supporting the gastrointestinal barrier, correcting or supporting dysbiotic gut flora (and even in the absence of diseases), disease or disorders involving intestinal dysmobility, enhancing or supporting the gastrointestinal mobility, or antagonizing disease-related bacterial infection; vaginosis; colitis or traveler's diarrhea, peritonitis, post-operative ileus, irritable bowel syndrome (IBS), intestinal pseudo-obstruction, and/or constipation psychological disorders, such as depression or anxiety, enteric infectious disease, infection-induced colitis, traveler's diarrhea, inflammatory bowel disease (IBD), colitis, diarrheal illness, vaginosis, wound, burns, psoriasis, dermatitis, tooth decay, periodontitis, sinusitis, or any of chronic and/or recurrent disease that is caused by pathogenic bacteria displacing healthy bacteria or necrotizing enterocolitis (NEC); to support anti-bacterial immunity, enhancing or supporting the gastrointestinal barrier, or antagonizing disease-related bac-